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**CELLS HAVING AMPLIFIED SIGNAL TRANSDUCTION PATHWAY  
RESPONSES AND USES THEREFOR**

10                   **Abstract**

15                   The invention provides recombinant cells that have been engineered such that  
ligand stimulation of a receptor expressed by the cells leads to amplified signal  
transduction responses. In one embodiment, the receptor-expressing cells have been  
engineered to carry a heterologous DNA construct comprising a gene encoding a protein  
that activates the signal transduction pathway, which gene is operatively linked to a  
promoter that is responsive to activation of the signal transduction pathway. Stimulation  
of the receptor by a ligand leads to expression of the heterologous DNA construct  
encoding the protein that activates the signal transduction pathway such that signals  
20                   generated by ligand binding to the receptor are amplified. Preferred cells are yeast cells  
expressing heterologous G protein coupled receptors functionally coupled to the yeast  
pheromone response pathway and overexpressing Ste5p, Ste4p, Ste12p, Ste11p or a  
dominant truncation allele of Ste20 via a pheromone-responsive promoter. The  
invention further provides cells expressing a heterologous receptor, wherein an  
25                   endogenous gene encoding a protein that negatively regulates an endogenous signal  
transduction pathway is mutated to render the protein nonfunctional such that signals  
generated by ligand binding to the receptor are amplified. The invention further  
provides cells expressing a heterologous receptor, wherein an endogenous gene  
encoding a protein that positively regulates an endogenous signal transduction pathway  
30                   is mutated to a supersensitive form such that the sensitivity of the pathway to ligand  
stimulation is increases. Methods of using the cells of the invention to identify receptor  
modulators are also provided.